The Physician as Patient: The Thallium Treadmill Stress Test

J.I. Frederick Reppun MD

I don't think it's often that a physician describes how it feels to be a patient; we order tests on our patients glibly, without realizing what it's like for the patient to undergo the procedure. The following is a personal experience that both physicians and patients might enjoy reading.

I'll not hide names or places, because the facility and its staff deserve the praise I intend to give them. The facility, of which we in Hawaii can be very proud, is Queen's Medical Center in Honolulu (QMC) and its nuclear medicine imaging department.

Asymptomatic cardiac-wise, I had occasion to require a thallium treadmill stress test (TST) at QMC. Appointment and preregistration were done by phone, saving a great deal of time and fuss for all. On arrival, I was directed to the area where several necessary consent and disclaimer forms had to signed and then delivered to the actual imaging complex. The cheerful woman at this desk whips these out in record time.

Jody, the young, pleasant, cardiac imaging tech who was in charge of that particular section, quickly came up to me as I waited in the pleasant and comfortable waiting alcove and said she would be attending to me. A young man in a scrub suit, wheeling a shopping cart full of supplies, announced himself as an I.V. tech and took me to a small room around the corner, where he inserted an intracath into my wrist (it had to be the left) vein very expertly. Not as in the days pre-AIDS, he put on gloves to do the procedure—because, horror of horrors, he might become contaminated by blood! Then, back to the alcove and a short wait.

Jody took me into the inner sanctum to show me the massive treadmill and demonstrated how it worked by getting on it herself. She pressed several buttons to illustrate how it could be speeded up from a rate of 1.7 mph to 4.2 mph, the latter indeed a fast walk, while the patient hangs on to a horizontal, firm bar. The two young nuclear medicine techs, Mike and Brian, who comprised the staff under Jody, hovered around and added explanatory comments and comforting reassurances. All were gowned in professional long white coats. The spacious white-walled room hummed with numerous motors as they were turned on and into action. A tall EKG podium was wheeled into place near me and I was quickly hooked up to it with wires all over my bare chest, a velcro belt strapped around my waist, and a sphygmomanometer applied to my right arm (of course, so as not to obstruct the intracath on the left).

As we waited for Joana Magno MD, cardiologist, to stand-by, I had a pleasant conversation with Jody and learned that Jody's grandfather on her mother's side was Leon Mermod MD, the original physician in charge of the Honolulu Blood Bank before Forrest J. Pinkerton MD took over. When I knew Leon in the 1950s, he was practicing in Waipahu. He and his brother Roger, also a physician, had been pineapple plantation physicians on Lanai together, long before my tenure there in 1946 to 1948. The Mermods were colleagues and good friends of my father in the 1920s and 1930s (a bit of medical history).

As soon as Dr Magno appeared, I straddled the treadmill as instructed, it was turned on and I was told to step well forward while holding onto the bar, and walk fast enough to keep up. Mike was on my left, the irradiated thallium in a syringe affixed to the intracath. Just before the last minute of three, he injected it. Brian was on my right, pumping up the sphygmo and asking how I was doing. The EKG podium to my right and behind was running a continuous strip and being monitored. When the three minutes were up, I was panting and my heart rate had increased to the desired level for my age, 188 per minute. A team of 4 people was in close attendance—permeating the procedure with comforting reassurance.

Dr Magno left as I was quickly disconnected from all the wires except the sphygmo, and assisted up two steep steps to lie down on a very narrow, egg-crate padded platform. My right arm was placed on a table alongside; my left arm was placed so as to be behind my head, ie, out of the way of my left chest and it was strapped down tight so that I could not move it, but gently, of course, I was asked to stay absolutely still, but was allowed to breathe, naturally, and allowed to answer questions by talking. Then a huge, thick, round disk supported on a metal bar that held an air hose that was obviously to cool the camera mechanism inside was swung over me so as to peer at my heart from the far right, through the right lateral chest wall and lung. Motors were running. Every few minutes the disk moved a few centimeters each time in an arc over my head and chest. Forty five minutes later—a very long time, it seemed—and 32 stations later, it had swung automatically clear over to my left to peer at my heart through the left lateral chest wall and lung. By then, my left shoulder was beginning to ache. When it was finally released by Mike or Brian, I could hardly bring it down without twinges of mild pain. However, I was closely monitored and questioned as to how I was doing at intervals throughout the long period of time.

I was assisted in sitting up, my feet helped over the side and onto the top step, to rest and recover while the "film was checked." Finally, Marc Coel MD, the nuclear medicine specialist, came out of the inner computer room where he had been reading the films. He greeted me and told me that my heart had a small area of ischemia at the apex—I felt nothing at all abnormal in my chest—and ordered an application of NTG paste to my right upper chest by Mike, as a precaution, I guessed.

I was helped down off the narrow platform, put my shirt back on and spent the next 3 hours sitting in the waiting room where I nearly froze to death in the subterranean bowels of QMC to

which the air-conditioning system brought the coldest air! I could have asked for a blanket but decided to tolerate it as I nearly finished reading the last half of the 11th volume of the Aubrtey/Maturin series by Patrick O'Brian, fictionalized history of the time of Napoleon Bonaparte.

Mike had me drink 2 large cups of water and allowed me to eat some crackers I had brought along. Jody had explained to me that the reason for NPO after midnight and no food or fluids pretest was that the tagged thallium perfused all the muscles in the body, the most continuously active muscle being the heart, therefore concentrating it there, and the gastrointestinal area needed to be kept quiet and inactive, or be in competition with the heart's thirst for the thallium. This period of rest, quiet, little food but a fluid flush was obviously to clear the irradiated thallium from the body, and given enough time to do so after the heart had been stressed and pictured. At the end of the 3-hours, the repeat picturing would be of the quiet, resting heart by contrast; if any defect was shown, it would be necessary, as in my case, to see whether it would disappear at the subsequent go-round, indicating perhaps temporary spasm, rather than a permanent infarct.

Just as I got to the exciting ending of my book, Mike came to fetch me, help me up onto the platform, and I submitted to the repeat process. An hour later, I was through, again the most uncomfortable part being my left shoulder as my left arm was strapped awkwardly, hand on the crown of my head. Once more, he had injected the same dose of thallium into the intracath before I climbed back onto the platform.

This time it was Dr Jarret Ko who came out to greet me and invite me into the computer room to view the screen.

This was the most fascinating part of the whole procedure. As a physician/patient, I was able to appreciate the marvel that modern technology has now equipped us physicians with specific and precise means of diagnosis that in times past were denied us. Dr Ko told me that the EKG is only 60% specific, ie, 40% of no value; until recently it was the only means of confirming cardiopathology since its invention in 1903.

When President Harding died in August 1923—just 71 years ago—of an acute myocardial infarction, the death was ascribed to *Apoplexy, caused by acute indigestion from crabmeat—copper ptomaine poisoning*. The EKG was too cumbersome to be taken to the President's hotel room in San Francisco during his terminal illness.[1]

When President Eisenhower had his heart attack in 1955—just 40 years ago—the pragmatic treatment was prolonged bedrest (he recovered without benefit of specific medication).[1] At the time, I was on Molokai (at times the only GP on the island of 5,000 souls). Cardiologist Bill Hartwell used to come over in consultation and prescribe strict bedrest for 30 days minimum. "Instruct the patient: This is one illness you cannot fight your way out of," he would say.

Here at Queen's in front of me on the big screen was this tiny little red and pink heart. It was in a rectangular box outlined by transparent lines. Dr Ko spun the box around within it spinning on a three-dimensional axis. "See," he said, "There's a black spot at the apex; it has not perfused with blood; it is ischemic."

A lay person would have thought it was a Walt Disney artifact. Instead, it gave a precise and specific diagnosis; it projected a precise and specific way of treatment and eliminated all guesswork. So do an MRI and a CT-scan and many other modern medical technologies.

The health care gurus talk about how expensive these are; that they should be rationed in one way or another in order to keep the costs of medical care down, as they relate to GNP. I thought to myself: Now that we have these marvels, why not let them be used for the benefit of all our people, rich or poor, young or old, as specifically indicated by professionals trained in their use? I looked around me. What a marvel of adjunctive engineering. What a marvel of staffing with trained experts, each of whom knows exactly what to do in small or big ways, putting common people to work in service to humankind. What a contrast to the workers in a military tank or bomber factory, who produce nothing of lasting value to anyone. What a contrast to what I had seen in a Siberian city hospital in 1992: Excellent and caring physicians working only with their five senses, without one CT-scan in a city the size of Honolulu, not to speak of a dreamed-of, nonexistent MRI!

Reference

1. Bollet, AJ. Plagues and poxes, the rise of epidemic disease. NY Demos Publications. 1987: 141-148.